

Effect of Bleaching on Color Change of Stained Resin Composites

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Abstract. The aim of this study was to evaluate the effects of bleaching on color change of stained resin composites. Ninety disk-shaped specimens were prepared with 3 different composite materials (Estelite Σ Quick, Premise, and Filtek Z350 XT). After stored in artificial saliva at 37°C for 24 hours in an incubator, the 30 specimens of each material were divided into 3 subgroups and immersed in either coffee, red wine, or artificial saliva (control) at 37°C. After 24 days, spectrophotometric measurement was performed. After the staining process, the bleaching agent (Opalescence, 10% carbamide peroxide) was applied to the surface of the specimens, 8 hours per day for 14 days. After the bleaching process, spectrophotometric measurement was performed. The color differences between specimens before and after bleaching were statistically significant ($\Delta E^*ab > 3.3$) for all composites in the red wine staining. The highest-level color change after bleaching was observed for Filtek Z350 XT in red wine staining, while the least value was found in Estelite Σ Quick in coffee staining. In summary, color changes of all red wine-stained composites after bleaching were noticeable and have higher level of color change than coffee-stained composites.

Introduction

Resin composite is one of the most popular esthetic restorative material in dental clinical practice for conservative and non-invasive treatment. Manufacturers have introduced different shades for restorative materials, capable of fulfilling all the requirements for environment light sensitivity, depth of cure, and especially, color match and stability. As an esthetic restorative material, resin composite should mimic the appearance of natural tooth, and this fact is directly related to the material's color match and color stability [1].

Although great improvements have been achieved during recent years, one of the major disadvantages of resin composites is the tendency to discolor after prolonged exposure to the environment in oral cavity [2-3]. This disadvantage is one of the main reasons for replacement of restoration [4]. Discoloration of resin composites may be caused by intrinsic and extrinsic factors. Intrinsic factors such as incomplete polymerization, initiators, fillers, and pigments can affect the color stability of resin composite [5-6]. Extrinsic factors such as absorption of stains from foods and drinks may also cause discoloration [7-8]. Red wine and coffee have the highest staining potential compared to the other drinks [9].

Bleaching has been suggested as an efficient and non-destructive treatment for discoloration of the teeth [10-12]. Some studies showed that the discoloration of resin composite can be partially removed by bleaching [13-14].

The aim of the study was to evaluate the effect of bleaching on color change of three resin composite brands with different types and amount of chemical components, stained by high-staining potential drinks.